they are in good condition and safe and suitable for service.

SPEED INDICATORS

§ 230.68 Speed indicators.

Steam locomotives that operate at speeds in excess of 20 miles per hour over the general system of railroad transportation shall be equipped with speed indicators. Where equipped, speed indicators shall be maintained to ensure accurate functioning.

ASH PANS

§ 230.69 Ash pans.

Ash pans shall be securely supported from mud-rings or frames with no part less than 2½ inches above the rail. Their operating mechanism shall be so arranged that they may be safely operated and securely closed.

BRAKE AND SIGNAL EQUIPMENT

§ 230.70 Safe condition.

(a) *Pre-departure inspection.* At the beginning of each day the locomotive is used, the steam locomotive operator shall ensure that:

(1) The brakes on the steam locomotive and tender are in safe and suitable condition for service;

(2) The air compressor or compressors are in condition to provide an ample supply of air for the locomotive service intended;

(3) The devices for regulating all pressures are properly performing their functions;

(4) The brake valves work properly in all positions; and

(5) The water has been drained from the air-brake system.

(b) *Brake pipe valve required.* Each steam locomotive shall have a brake pipe valve attached to the front of the tender, the rear of the back cab wall, or adjacent to the exit of a vestibuled cab. The words ''Emergency Brake Valve'' shall be clearly displayed near the valve.

§ 230.71 Orifice testing of compressors.

(a) *Frequency of testing.* The compressor or compressors shall be tested for capacity by orifice test as often as conditions may require, but not less frequently than once every 92 service days.

(b) *Orifice testing criteria.* (1) Compressors in common use, as listed in the following table, shall have orifice test criteria as follows:

Make	Compressor size	Single strokes per minute	Diameter of orifice (in inches)	Air pressure maintained (in pounds)
Westinghouse	9½	120	11/64	60
Westinghouse	11	100	3/16	60
Westinghouse	150 CFM 8½ CC	100	9/32	60
Westinghouse	120 CFM 8½	100	15/64	60
New York	2a	120	5/32	60
New York	6a	100	13/64	60
New York	5b	100	15/64	60

NOTE: This table shall be used for altitudes to and including 1,000 feet. For altitudes over 1,000 feet the speed of compressor may be increased 5 single strokes per minute for each 1,000 feet increase in altitude.

(2) For compressors not listed in the table in paragraph (b)(1) of this section, the air pressure to be maintained shall be no less than 80 percent of the manufacturer's rated capacity for the compressor.

§ 230.72 Testing main reservoirs.

(a) *Hammer and hydrostatic testing.* Except as described in paragraphs (b) through (d) of this section, every main reservoir, except those cast integrally with the frame, shall be hammer and hydrostatically tested during each annual inspection. The reservoir shall be hammer tested while empty and with no pressure applied. If no defective areas are detected, a hydrostatic test of MAWP shall be applied.

(b) *Drilling of main reservoirs.* (1) Only welded main reservoir originally constructed to withstand at least five times the MAWP may be drilled over its entire surface with telltale holes that are 3/16 of an inch in diameter. The

holes shall be spaced not more than 12 inches apart, measured both longitudinally and circumferentially, and drilled from the outer surface to an extreme depth determined by the following formula:

$$D=(.6PR/(S-.6P))$$

Where:

D = Extreme depth of telltale holes in inches but in no case less than one-sixteenth inch;
P = certified working pressure in psi;
S = ⅛ of the minimum specified tensile strength of the material in psi; and
R = inside radius of the reservoir in inches.

(2) One row of holes shall be drilled lengthwise of the reservoir on a line intersecting the drain opening. When main reservoirs are drilled as described in paragraph (b)(1) of this section, the hydrostatic and hammer tests described in paragraph (a) of this section are not required during the annual inspection. Whenever any telltale hole shall have penetrated the interior of any reservoir, the reservoir shall be permanently withdrawn from service.

(c) *Welded main reservoirs without longitudinal lap seams.* For welded main reservoirs that do not have longitudinal lap seams, an appropriate NDE method that can measure the wall thickness of the reservoir may be used instead of the hammer test and hydrostatic test required in paragraph (a) of this section. The spacing of the sampling points for wall thickness shall not be greater than 12 inches longitudinally and circumferentially. The reservoir shall permanently be withdrawn from service where the NDE testing reveals wall thickness less than the value determined by the following formula:

$$t=(PR/(S-.6P)$$

Where:

t = Minimum value for wall thickness;
P = Certified working pressure in psi;
S = ⅛ of the minimum specified tensile strength of the material in psi, or 10,000 psi if the tensile strength is unknown; and
R = Inside radius of the reservoir in inches.

(d) *Welded or riveted longitudinal lap seam main reservoirs.* (1) For welded or riveted longitudinal lap seam main reservoirs, an appropriate NDE method that can measure wall thickness of the reservoir shall be used instead of, or in addition to, the hammer test and hydrostatic test. The spacing of the sampling points for wall thickness shall not be greater than 12 inches longitudinally and circumferentially. Particular care shall be taken to measure along the longitudinal seam on both plates at an interval of no more than 6 inches longitudinally. The reservoir shall be withdrawn permanently from service where NDE testing reveals wall thickness less than the value determined by the following formula:

$$t=(PR/(0.5S-0.6P))$$

Where:

t = Minimum value for wall thickness;
P = Certified working pressure in psi;
S = ⅛ of the minimum specified tensile strength of the material in psi, or 10,000 psi if the tensile strength of steel is unknown; and
R = Inside radius of the reservoir in inches.

(2) Repairs of reservoirs with reduced wall thickness are prohibited.

§ 230.73 Air gauges.

(a) *Location.* Air gauges shall be so located that they may be conveniently read by the engineer from his or her usual position in the cab. No air gauge may be more than 3 psi in error.

(b) *Frequency of testing.* Air gauges shall be tested prior to reapplication following removal, as well as during the 92 service day inspection and whenever any irregularity is reported.

(c) *Method of testing.* Air gauges shall be tested using an accurate test gauge or dead weight tester designed for this purpose.

§ 230.74 Time of cleaning.

All valves in the air brake system, including related dirt collectors and filters, shall be cleaned and tested in accordance with accepted brake equipment manufacturer's specifications, or as often as conditions require to maintain them in a safe and suitable condition for service, but not less frequently than after 368 service days or during the second annual inspection, whichever occurs first.

§ 230.75 Stenciling dates of tests and cleaning.

The date of testing and cleaning and the initials of the shop or station at